USEPA Comments on *Work Package #66:*
Draft Survey Units Project Reports for Units 313, 331, and 338
USEPA Comments dated October 14, 2015

General comments

1. While formatting changes could make the reports more explicitly address CERCLA measures and help provide the reader with more context, EPA concurs with the Navy's finding that the Work Package #66 containing Draft Survey Units 313, 331, and 338 are suitable for free release with no additional work needed with respect to radioactive contamination using Superfund criteria, but with the qualification for Survey Unit 313, as noted in the specific comment #1 below.

   Neither the Radionuclides of Concern (ROCs) nor the release criteria are listed in the report, but are referenced in the *Final Survey Unit Project Reports Abstract for Sanitary Sewer and Storm Drain Removal Containing Naturally Occurring Radioactive Material (NORM) Fill Material Conducted After March 1, 2013*, dated June 2014, which was prepared by TetraTech EC, Inc. However, as with all trench excavation, the radionuclides for which the report's risk analysis was performed are ^{90}Sr, ^{137}Cs and ^{226}Ra. The risk associated with the sum of the average concentrations of the ROCs may not exceed Superfund's nominal risk management range of 10^{-6} to 10^{-4}. Using the current version of EPA Superfund Division's PRG calculator [HYPERLINK "http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search"], the soil concentrations that are associated with a risk of 10^{-4} in the suburban residential land use scenario are as follows:

^{90}Sr	6.63	pCi/gm
^{137}Cs	5.09	pCi/gm
^{226}Ra	0.666	pCi/gm*

   *By previous agreement between U.S. EPA Region 9 and the Navy, the soil concentration that is associated with a risk of 10^{-4} is taken to be 1.00 pCi/gm above the site's reference area background concentration.

   The Navy's risk analysis does not conform to EPA's. Although the Navy's risk analysis is sufficient in this case, see below in specific comments the use of EPA's dose/risk coefficient with the reported mean soil concentrations to evaluate the risk associated with the survey units in this work package.

2. Section 3.3 references the *Final Survey Unit Project Reports Abstract for Sanitary Sewer and Storm Drain Removal Containing Naturally Occurring Radioactive Material (NORM) Fill Material Conducted After March 1, 2013*, dated June 2014, for reference area background concentrations. But the report does not state what the reference area background concentrations are. According to Table 6-1, the average reference area ^{226}Ra concentration was taken to be 1.057 pCi/gm. Past reports for trench unit surveys have typically cited a reference area ^{226}Ra concentration of slightly below 0.5 pCi/gm. Please provide a more thorough explanation for the selection of reference area (background) ^{226}Ra concentrations and under which circumstances different background concentrations will be used.

   The estimates below of both dose and risk is higher than the Navy's estimate, based on the same average concentrations in the trench unit but assuming a much lower (and therefore more conservative) reference area ^{226}Ra concentration of 0.5 pCi/gm. The risk levels, still, however, fall within the USEPA risk range.

   As a related minor comment that pertains to Survey Units 331, 333, and 338, the citation regarding the reference area background concentration appears to possibly refer to the document

at this link: [HYPERLINK "http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/5626955926/RMAC-0809-0012-0052%20Fnl%20SUPRA%20NORM_CD.pdf"]. If so, this document is dated May 2015, not 2014. Please correct the date, if necessary, in the narrative and list of references.

Specific Comments

1. Survey Unit 313: Using an assumed reference area ^{226}Ra concentration of 0.5 pCi/gm, the net *average* ^{226}Ra concentration above background can be taken as 0.687 – 0.5 = 0.187 pCi/gm. Appropriately, the Navy's contractor has taken the background (reference area) concentrations of ^{90}Sr and ^{137}Cs to be zero, because they are strictly anthropogenic radionuclides; those net concentrations are therefore 0.213 and 0.025 pCi/gm, respectively.

Comparison Summary of Dose and Risk Calculations from Reported Mean Soil Concentrations

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Trench Unit					
^{90}Sr	0.213	--	--	0.1459	3.21E-06
^{137}Cs	0.025	--	--	0.0223	4.91E-07
^{226}Ra	0.187	--	--	1.2775	2.81E-05
Total		0.7228	9.316E-06	1.4458	3.18E-05

NOTE: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10-7 per mrem as described in Federal Guidance Report No. 13 *Cancer Risk Coefficients for Environmental Exposure to Radionuclides* EPA 402-R-99-001 dated September 1999.

The report concludes with a recommendation that no further action is required in this survey unit and that the survey unit can be released from institutional controls. EPA's concurrence with the Navy's recommendation is *limited only to the trench prior to backfill* until final results, including backfilling the trench, are reported.

2. Survey Unit 313: Section 3.2.1 states that "The analytical results did not identify any ROC above the release criteria." But Table 3-1 shows that the measured ^{226}Ra concentration of 1.329 pCi/gm in Sample 23 exceeds the agreed-upon concentration limit of 1.00 pCi/gm. Please revise the report to address this apparent discrepancy. For example, the statement could say that none of the average ROC concentrations in the survey unit exceed any of the release criteria.

3. Survey Unit 333: Using an assumed reference area ^{226}Ra concentration of 0.5 pCi/gm, the net *average* ^{226}Ra concentration above background for the trench unit can be taken as 0.808 – 0.5 = 0.308 pCi/gm. Similar calculations appear below for the backfill and for Excavated Soil Units 836 and 839. Appropriately, the Navy's contractor has taken the background (reference area) concentrations of ^{90}Sr and ^{137}Cs to be zero, because they are strictly anthropogenic radionuclides.

Comparison Summary of Dose and Risk Calculations from Reported Mean Soil Concentrations

Radionuclide	Reported Mean Soil Concentration (net above background) pCi/gm	Navy (RESRAD) Estimated Dose Rate mrem/yr	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate mrem/yr	EPA (PRG Calculator) Estimated Cancer Risk
Trench Unit					
^{90}Sr	0.184	--	--	0.1259	2.77E-06
^{137}Cs	0.024	--	--	0.0215	4.72E-07
^{226}Ra	0.303	--	--	2.0686	4.55E-05
Total		0.6748	8.702E-06	2.2159	4.87E-05
Backfill					
^{90}Sr	0.154	--	--	0.1055	2.32E-06
^{137}Cs	0.021	--	--	0.0188	4.13E-07
^{226}Ra	0.022	--	--	0.1500	3.30E-06
Total		0.6748	8.702E-06	0.2743	6.03E-06
Excavated soil unit 836					
^{90}Sr	0.164	--	--	0.1123	2.47E-06
^{137}Cs	0.024	--	--	0.0215	4.72E-07
^{226}Ra	0.417	--	--	2.8460	6.26E-05
Total		--	--	2.9797	6.55E-05
Excavated soil unit 839					
^{90}Sr	0.125	--	--	0.0855	1.88E-06
^{137}Cs	0.023	--	--	0.0205	4.52E-07
^{226}Ra	0.189	--	--	1.2911	2.84E-05
Total		--	--	1.3972	3.07E-05

NOTE: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10-7 per mrem as described in Federal Guidance Report No. 13 *Cancer Risk Coefficients for Environmental Exposure to Radionuclides* EPA 402-R-99-001 dated September 1999.

4. Survey Unit 333: Section 3.2.1 states that "none of the sample results identified activity above the release criterion for any ROC." However, Table 3-1 shows that the measured ^{226}Ra concentrations in 3 samples, and Table 3-2 shows that the measured ^{226}Ra concentrations in 2 samples, exceed the agreed-upon concentration limit of 1.00 pCi/gm. Please revise the report to correct this apparent discrepancy. For example, a proper correction to the statement might be to say that none of the average ROC concentrations in the survey unit exceed any of the release criteria.

5. Survey Unit 333: The ^{226}Ra concentrations in Sample 26 of 1.575 pCi/gm, as described in the next of Section 3.2.1, is not included in any of Tables 3-1 to 3.3. Please include it or explain why it is not included.

6. Survey Unit 333: Please explain why Section 7.6 does not include a recommendation that the survey unit be released from institutional controls.

7. Survey Unit 338: Using an assumed reference area ^{226}Ra concentration of 0.5 pCi/gm, the net *average* ^{226}Ra concentration above background for the trench unit can be taken as 0.553 – 0.5 = 0.053 pCi/gm. Appropriately, the Navy's contractor has taken the background (reference area) concentrations of ^{90}Sr and ^{137}Cs to be zero, because they are strictly anthropogenic radionuclides.

Comparison Summary of Dose and Risk Calculations from Reported Mean Soil Concentrations

	Reported Mean Soil Concentration (net above background)	Navy (RESRAD) Estimated Dose Rate	Navy (RESRAD) Estimated Cancer Risk	EPA (PRG Calculator) Estimated Dose Rate	EPA (PRG Calculator) Estimated Cancer Risk
Radionuclide	pCi/gm	mrem/yr		mrem/yr	
Backfill					
^{90}Sr	0.152	--	--	0.1042	2.293E-06
^{137}Cs	0.020	--	--	0.0179	3.929E-07
^{226}Ra	0.000	--	--	0.0000	0.000E+00
Total		0.7101	9.128E-06	0.1221	2.686E-06
Trench Unit					
^{90}Sr	0.160	--	--	0.1097	2.413E-06
^{137}Cs	0.021	--	--	0.0188	4.126E-07
^{226}Ra	0.053	--	--	0.3618	7.958E-06
Total		0.8846	1.133E-05	0.4903	1.078E-05

NOTE 1: Where reported mean soil concentrations (net above background) are reported as values that are less than zero, I have based my dose and risk calculations on a soil concentration of zero.

NOTE 2: The PRG Calculator's slope factors use a risk/dose coefficient of 8.46X10-7 per mrem as described in Federal Guidance Report No. 13 *Cancer Risk Coefficients for Environmental Exposure to Radionuclides* EPA 402-R-99-001 dated September 1999.

8. Survey Unit 338: Please explain if the Navy has future plans to remove 30 feet of pipe associated with trench segment 12-C31-00-2K or if all remedial activities in Survey Unit 338 are now considered to be complete.

9. Survey Unit 338: Section 5 states that "Because all sample results in Table 3-1 through 3-4 were less than the release criteria for the ROCs, there is no basis for performing the statistical tests for Trench Unit 333 and Excavated Soil Units 852, 853 and 856 per Section 8.2.2.1 of the Multi-Agency Radiation Survey and Site Investigation Manual." However, Table 3-1 shows that the measured ^{226}Ra concentration in 1 sample exceeds the agreed-upon concentration limit of 1.00 pCi/gm. Please revise the report to address this discrepancy. For example, a proper correction to the statement might be to say that none of the average ROC concentrations in the survey unit exceed any of the release criteria.

10. Survey Unit 338: Section 3.2.2 states that soil from Excavated Soil Units 852, 853, and 856 was used as backfill material. However, Tables 3-3 and 3-4 show only analysis results for soil samples that were collected from Units 853 and 856; the report provides no results for Unit 852. Please include analysis results for soil samples that were collected from Excavated Soil Unit 852 in the final version of the report.

11. Survey Unit 338: Please explain why Section 7.6 does not include a recommendation that the survey unit be released from institutional controls.